

REMARKS

Claims 1-21 are pending in this application. Claims 11-21 have been withdrawn from consideration by the Examiner for being directed to non-elected subject matter. By this Amendment, Claims 2-3 have been cancelled without prejudice or disclaimer and Claim 1 has been amended. As Claim 1 has been amended to incorporate the subject matter recited by cancelled Claims 2-3, Applicants respectfully submit that no new matter is presented herein.

Information Disclosure Statement

The Office Action states the Information Disclosure Statement filed April 6, 2005 fails to comply with 37 C.F.R. §1.98(a)(3) because it does not include a concise explanation of the relevance of Reference AM, which is not in the English language. Enclosed herein is a concise explanation of the relevance of Reference AM so that the Examiner may consider Reference AM. Applicants also enclose herein a copy of Form PTO-1499 for the convenience of the Examiner.

Concise Explanation of Reference AM

Reference AM is submitted merely to show that the reference discloses SBT material as a ferroelectric, but does not disclose that the surface of the electrode is terminated by fluorine.

Claims 1-10 Recite Patentable Subject Matter

A. Claims 1-6 and 8 are rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent Number 6,783,998 to Nakamura in view of U.S. Patent Number 4,581,099 to Fukaya et al. (hereinafter "Fukaya"). Applicants respectfully traverse the rejection.

Claim 1 recites a dielectric device including a first electrode layer having constituent elements located on a surface thereof that are terminated by halogen atoms. A dielectric film is formed on the surface of the first electrode that is terminated by the halogen atoms. The first electrode layer contains at least one element selected from a group consisting of Pt, Ir, Pd and Ru and the halogen atoms are fluorine atoms.

In other words, Claim 1 recites a dielectric device having a dielectric film formed on an electrode wherein a surface of the electrode upon which the dielectric film is disposed has constituent elements that are terminated by halogen atoms. Put simply, the halogen atoms are provided on the surface of the electrode where the dielectric film contacts the surface of the electrode. Furthermore, the first electrode layer contains at least one element selected from a group consisting of Pt, Ir, Pd and Ru and the halogen atoms are fluorine atoms.

Applicants maintain the applied art of record fails to teach or suggest such a structural arrangement.

The Office Action again states Nakamura discloses a first electrode (1) containing PT and formed by etching using fluoride gas, which forms a platinum fluoride on its surface (column 7, line 58 to column 8, line 35); a ferroelectric film (2) of $\text{SRBi}_2\text{Ta}_2\text{O}_9$; and a second electrode (3). The Office Action points to Figure 1(a) and column 4, lines 36-67 to support the statement regarding Nakamura' disclosure. The Office Action again admits Nakamura does not explicitly show, i.e., disclose or teach, the first electrode surface terminated by the fluorine atoms.

To overcome the admitted deficiency in Nakamura, the Office Action again applies Fukaya for teaching (Column 4, line 64 to column 5, line 2) that etching with halogen atoms, such as fluorine, terminates the material being etched.

The Office Action then asserts that it would have been obvious to a person of ordinary skill in the art at the time of the invention to terminate the surface of the first electrode of Nakamura since Fukaya teaches that etching with halogen atoms, such as fluorine, terminates the material being etched.

Although Fukaya discloses an electrode that is exposed to fluorine, Applicants respectfully note that Fukaya does not disclose that the electrode containing at least one element selected from a group consisting of Pt, Ir, Pd and Ru is terminated by fluorine.

Applicants further note that Hwang discloses that a mask (18) formed on a Pt (16) is etched using Ar, Cl₂ and BCl₃ gases. In such a process, Hwang, however, discloses that a surface of Pt (16) is not terminated by fluorine when the mask (18) is removed by etching because Ar, Cl₂ and BCL₃ gases, not fluorine gas, are used in the etching process.

As such, Applicants respectfully submit that Hwang, like Nakamura and Fukaya, does not disclose that the electrode containing at least one element selected from a group consisting of Pt, Ir, Pd and Ru is terminated by fluorine.

To establish *prima facie* obviousness of a rejected claim, each and every feature of the rejected claim must be taught or at least suggested by the applied art of record. See M.P.E.P. §2143.03. Because Fukaya, Nakamura, and Hwang, alone or in combination, fail to teach or suggest each and every feature of Claim 1, Applicants

respectfully submit the Office Action has not established *prima facie* obviousness of Claim 1 and that Claim 1 should be deemed allowable for at least for this reason.

Claims 4-6 and 8 depend from Claim 1. It is respectfully submitted that these dependent claims be deemed allowable for at least the same reasons Claim 1 is allowable, as well as for the additional subject matter recited therein.

As such, Applicants respectfully request withdrawal of the rejection.

B. Claim 7 is rejected under 35 U.S.C. §103(a) as being unpatentable over Nakamura in view of Fukaya, as applied to Claim 1 above, and further in view of JP 11-068057 to Furukawa. Applicants respectfully traverse the rejection.

Nakamura and Fukaya are discussed above.

Furukawa is applied for teaching that it is known to have a bismuth layer substantially perpendicular to the first electrode to provide a dielectric device with superior polarization characteristics.

The Office Action then asserts that it would have been obvious to one of ordinary skill in the art at the time of the invention to arrange the bismuth layer substantially perpendicular to the first electrode as taught by Furukawa in the Nakamura device after it has been modified as discussed above according to the applied teachings of Fukaya.

Applicants respectfully submit that Furukawa does not overcome the deficiencies of Nakamura and Fukaya discussed above.

To establish *prima facie* obviousness of a rejected claim, each and every feature of the rejected claim must be taught or at least suggested by the applied art of record. See M.P.E.P. §2143.03. Because Fukaya and Nakamura, alone or in combination, fail to teach or suggest each and every feature of Claim 1, from which Claim 7 depends and

includes all of the features thereof, and because Furukawa does not overcome the deficiencies of Fukaya and Nakamura, Applicants respectfully submit the Office Action has not established *prima facie* obviousness of Claim 7 and that Claim 7 should be deemed allowable over Fukaya, Nakamura and Furukawa for at least for this reason.

As such, Applicants respectfully request withdrawal of the rejection.

C. Claim 9 is rejected under 35 U.S.C. §103(a) as being unpatentable over Nakamura in view of Fukaya, as applied to Claim 1 above, and further in view of U.S. Patent Number 6,046,469 to Yamazaki et al. (hereinafter "Yamazaki"). Claim 10 is rejected under 35 U.S.C. §103(a) as being unpatentable over Nakamura in view of Fukaya and Yamazaki, as applied to Claim 1 above, and further in view of U.S. Patent Number 6,320,213 to Kirlin et al. (hereinafter "Kirlin"). Applicants respectfully traverse both rejections.

Nakamura and Fukaya are discussed above.

Yamazaki is applied for teaching that it is known to form an adherent layer under a first electrode to provide a semiconductor device with good ohmic characteristics.

Kirlin is applied for teaching that it is known to use IrSiN to reduce the diffusion of aluminum and platinum.

Applicants respectfully submit that Yamazaki, as well as Kirlin, do not overcome the deficiencies of Nakamura and Fukaya discussed above.

To establish *prima facie* obviousness of a rejected claim, each and every feature of the rejected claim must be taught or at least suggested by the applied art of record. See M.P.E.P. §2143.03. Because Fukaya and Nakamura, alone or in combination, fail to teach or suggest each and every feature of Claim 1, from which Claims 9 and 10

depend and include all of the features thereof, and because Yamazaki and/or Kirlin do not overcome the deficiencies of Fukaya and Nakamura, Applicants respectfully submit the Office Action has not established *prima facie* obviousness of Claims 9 and 10 and that Claims 9 and 10 should be deemed allowable over Fukaya, Nakamura, Yamazaki, and Kirlin, alone or in combination.

As such, Applicants respectfully request withdrawal of both rejections.

Conclusion

In view of the foregoing, reconsideration of the application, withdrawal of the outstanding objection and rejections, allowance of Claims 1-10, and the prompt issuance of a Notice of Allowability are respectfully solicited.

Should the Examiner believe anything further is desirable in order to place this application in better condition for allowance, the Examiner is requested to contact the undersigned at the telephone number listed below.

In the event this paper is not considered to be timely filed, the Applicants respectfully petition for an appropriate extension of time. Any fees for such an extension, together with any additional fees that may be due with respect to this paper, may be charged to Counsel's Deposit Account No. 01-2300, **referencing Attorney Docket Number 024808-00014.**

Respectfully submitted,

ARENT FOX PLLC



Murat Ozgu
Attorney for Applicants
Registration No. 44,275

Customer No. 004372

1050 Connecticut Avenue, NW, Suite 400
Washington, DC 20036-5339
Telephone: (202) 857-6000

GEO:MO/elp

Enclosure: PTO Form 1449



FORM PTO-1449

U.S. DEPARTMENT OF COMMERCE
PATENT AND TRADEMARK OFFICE

ATTORNEY DOCKET NUMBER

024808-00014

NEW PATENT
APPLICATION

LIST OF REFERENCES CITED BY APPLICANT

(Use several sheets if necessary)

APPLICANT

Kazunari HONMA, et al.

FILING DATE

August 1, 2003

GROUP

U.S. PATENT DOCUMENTS

EXAMINER INITIAL		DOCUMENT NUMBER	DATE	NAME	CLASS	SUB- CLASS	FILING DATE
	AA						
	AB						
	AC						
	AD						
	AE						
	AF						

FOREIGN PATENT DOCUMENTS

		DOCUMENT NUMBER	DATE	COUNTRY	CLASS	SUB- CLASS	TRANSLATION		
							YES	NO	PART.
	AG	11-068057	March 9, 1999	Japan					X
	AH	2001-072416	March 21, 2001	Japan					X
	AI	11-080181	March 26, 1999	Japan					X
	AJ								
	AK								
	AL								

OTHER REFERENCES *(Including Author, Title, Date, Pertinent Pages, Etc.)*

	AM	Item 1 "Low Temperature Deposition Material" Section 4 "New Deposition Material" Ferroelectric Memory Advanced Process September 13, 1999
	AN	
	AO	

EXAMINER	DATE CONSIDERED
*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.	